NOTES FOR GEORGIA TECH PRESIDENT G. WAYNE CLOUGH
Kick-off Luncheon for Policy Research Initiative, March 19, 2004
"An Engineer in the World of Policy"

- Engineering has always created the technology that enabled humans to prosper, but we have often been behind the curve in foreseeing and understanding the human aspects of technological change.
    - Engineers invented and applied wide range of incredible technology, but in a rather decentralized, disjointed fashion.
    - All of those many disparate engineering efforts have now converged to form a world in which technology pervades every aspect of life.
    - Engineering decisions we used to regard as unrelated to social, political, and economic concerns have become tightly interwoven with them. Technology and social change have become a double helix – two strands that are inextricably interwoven.
    - Can no longer create technology in a vacuum and put it on the shelf with no consideration of how it might be used. Must view our work in a much larger social context and understand the larger, human dimensions and implications of what we are doing.

- Expand the role of engineers from "doers" to "deciders"
    - Joe Bordogna, deputy director of the National Science Foundation: "I like to think of the engineer as someone who not only knows how to do things right, but also knows the right thing to do."
    - The skills and perceptions of engineers – well suited to a broader leadership role in today's technological world.
    - Challenge: prepare engineers for that responsibility.

- Engineers have traditionally shunned the limelight:
    - Want to be 100% sure before they speak up
    - Preferred technology to people
    - Curriculum not focused on communication, leadership, presentation skills

- Result: Engineering is a "stealth" profession operating under public's radar screen. E.g. public perception surveys say 85 percent of the general public believes scientists can help solve our environmental problems, but only 5 percent believe engineers have a role.

- Technology becoming more ubiquitous in every aspect of life; growing need for leaders in broader arenas who understand and can manage technology:
    - Technological illiteracy is rampant. Even those with college degrees who use technology do not understand how it works, cannot envision its potential uses, misuses and abuses.

- Policy makers increasingly called to regulate technology (telecom), or to set policy on matters that involve technology (biotechnology), or to protect against the misuse/abuse of technology (Internet security). They need expert advice.

- Embedded in the problems and challenges our world faces are incredible opportunities for engineers to develop new technology and new solutions:
  - Environmental sustainability: 4 billion new people in next 50 years, mostly in undeveloped and politically unstable regions. In 20 years, per capita forest will be only 1/3 of its 1990 level; global warming will bring new threats; virtually every nation will have fresh water supply problems. (Aris Georgakakos' work on managing Nile River)
  - Global environmental conferences like Rio, Kyoto demonstrate difficulty political solution, which invariably call for someone to give up something. Engineers can step into the breach created by political stand-offs and offer solutions based on sustainable approaches and innovative technologies.
  - Developing world offers unique opportunity to leapfrog older technologies and bring new technology to the fore quickly. (Eg, huge power grids in developed world – expensive to maintain, vulnerable to terrorism, but difficult to abandon. Developing world: test new approaches like hydrogen fuel cells.)
  - Terrorism: infrastructure like large buildings, public transit, energy grids are vulnerable. New technology for detection, homeland security must be orchestrated with policy.
  - U.S. infrastructure falling apart: ASCE 2003 report card gives grade of D+, says $1.6 trillion needed.

- Engineers need to expand and enhance our communications with the larger public and interact more with government officials in shaping public policy.
  - Not partisan politics, but rather the process of establishing the legal and regulatory framework within which society operates. (Disastrous results if process driven by partisan politics rather than informed technological expertise.)
  - Engineers serve public good by helping the public and elected officials understand complex technological issues. True at the local level as well as at the national or global level.

- Personal experiences:
  - Local level: Mayor's Clean Water Advisory Group
  - State level: Telecom and natural gas advisory panels
  - Federal level: PCAST, Council on Competitiveness National Innovation Initiative

- Advantages to Georgia Tech of this kind of work:
  - Woody Allen: "80% of success is showing up." When Tech is visible at City Hall, State Capitol, Washington, it helps establish us as a national leader, a place that has valuable expertise and innovative solutions to offer.
  - Not only enhances our reputation, but opens doors of opportunity to make a difference in the broader world.

- In turn, affects the way engineers view their work:
    - See themselves as global citizens and technology as a tool to solve intricate social problems.
    - Ask not merely how can we make a piece of technology work better, but rather what new purpose can we make it serve so that it makes life better for individual people and for society at large.